

TAXONOMIC NOTES AND TYPIFICATION OF THE DIATOMS DESCRIBED BY C. MONTAGNE

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ABSTRACT — The diatoms (Bacillariophyta) described by Camille Montagne, which include one genus and eleven species, are listed and typified with specimens housed in the Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, Paris (PC). Photographs of the herbarium sheets on which the type material occurs and of original drawings made by Montagne of his new taxa are presented. Comments regarding possible synonyms and previous reports of Montagne's species are provided.

RÉSUMÉ — Le Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, Paris (PC), conserve les collections de Camille Montagne: spécimens, correspondance et dessins originaux. Les diatomées (Bacillariophyta) décrites par C. Montagne, un genre nouveau et onze espèces nouvelles, sont typifiées et illustrées par des photographies des échantillons types et par celles des dessins originaux qu'il avait effectués de ses nouveaux taxons. Un commentaire nomenclatural accompagne la synonymie des espèces et leurs éventuelles mentions antérieures dans la littérature.

Key Words — Diatom, Bacillariophyta, type, taxonomy, Camille Montagne, herbarium, PC, iconography.

INTRODUCTION

Camille Montagne (1784-1866), privately pursued a career in Botany in Paris beginning in 1830 after retiring from a career as a surgeon in the napoleonic military. Rapidly, he devoted his work to the study of cryptogams, particularly those from "exotic countries"; e. g. South America, Africa, etc... He donated his herbarium and manuscripts (including catalogues, notes, publications, proofs and correspondance) to the Muséum National d'Histoire Naturelle (PC). His herbarium included original drawings, and in order to conserve those drawings they have been separated from the specimens and provided with a numbering system that relates them to the specimens. There are more than 6000 drawings kept in acid-free sheets with the

manuscripts. Data from the herbarium labels and the drawings have been computerized in the Museum's computer cataloging system. Herbarium specimen numbers from the Montagne collection are designated beginning with "MS" while Montagne's drawings are designated beginning with "MA".

Montagne published on a wide array of cryptogams among these are his work on diatoms including the description of one new genus and eleven new species of diatoms. Some of his diatoms species are widely known, while others have apparently not been considered since their original description. We include here: 1) an alphabetical list of the diatoms described by Montagne and designation of lectotypes in the Laboratoire de Cryptogamie du Muséum National d'Histoire Naturelle of Paris (PC), 2) photographs of the herbarium sheets on which the type material occurs, 3) publication for the first time of Montagne's own illustrations of his species, and 4) a discussion of nomenclatural issues associated with some of the taxa. The present report is made to bring attention to and facilitate research on Montagne's diatom species.

A note concerning the date of publication of Montagne's works for the "*Annales des Sciences Naturelles, Botanique*" should be made. There was some delay between the date reported on the volume and the effective date of publication. The bibliography in the "*Compte rendus hebdomadaires des Séances de l'Académie des Sciences*" provides some evidence for a difference in the publication dates and this difference is suggested by other sources of information, including Montagne's notes on his manuscripts. For example, all the "9th Centurie" was prepared for the volume 14 of the "*Annales des Sciences Naturelles, Botanique*", year 1860, but the last proofs were sent to Montagne in July 1861. Therefore, volume 14 of the "*Annales des Sciences Naturelles, Botanique*", including this "Centurie" was edited in 1861, not in 1860 as indicated on the volume. Moreover, we cannot consider the reprints as preprints (see Stafleu & Cowan 1981, pp. 556-564), because the delay was due to the editor; reprints were made at the same time as the journal or just afterwards (D. Lamy, unpublished data).

CHECK-LIST AND TYPIFICATION OF DIATOM TAXA DESCRIBED BY C. MONTAGNE¹

Achnanthes brachypus Montagne, 1838, *Ann. Sci. Nat., Bot.*, 2^e sér., 8: 348, "1837" (1838).

= *Achnanthes pachypus* Montagne, 1839, *Voy. Amér. mérid., Bot. [Florula]*: 1. nom. superfl. (Greuter et al., 1994, Art. 52.1).

Holotype: PC n° MA 13863 (Figure 1).

Type locality and collector: "Ad fila *Confervae allantoidis* Montag. parasitans, prope Callao Regni Peruviani Cl. d'Orbigny legit".

¹ Type locality and collection information included in this checklist is quoted from the original species diagnoses.

Montagne's original illustration: PC n° MS 438-5875 (Figure 2) and 438-5876 (Figure 3), and a drawing directly on the herbarium sheet (Figure 1).

Comments: In the *Sylloge* (Montagne, 1856, p. 470) Montagne indicates *A. pachypus* was described in the *Florulae boliviensis* (Montagne, 1839, p. 1). In this 1839 work, however, Montagne refers to his work in the *Annales des Sciences naturelles* (1838), a publication that preceded the *Florulae boliviensis*. In 1838, this *Achnanthes* species was described as *A. brachypus*, and this name also is used in the original handwritten manuscripts housed at PC (n° MS 323). Thus the epithet « *brachypus* » (1838) has priority over the epithet « *pachypus* » (1839).

Mills (1933, p. 71), *sub pachypus*, considers this a valid species but Van Landingham (1967, p. 55) indicates it is a synonym of *A. brevipes* var. *parvula* (Kützing) Cleve. *Achnanthes pachypus* has been reported by Kützing (1844), Rabenhorst (1864) and Pritchard (1861).

Amphora vitrea Montagne, 1861, *Ann. Sci. Nat., Bot.*, 4^e sér., 14: 167, "1860" (1861).

Lectotype: PC n° MA 13882 (Figure 4).

Isotype: PC n° MA 13580.

Type locality and collector: "In aquis thermalibus Sti Nectarii (Puy-de-Dôme) *Oscillatoriae nectariensis* consortem hanc *Amphoram* legit mecumque communicavit cl. Basset, harum thermarum medicus inspector". Saint-Nectaire, France. (N.B. Type of *Oscillatoria nectariensis* Montagne: PC n° MA 13579, typified by F. Drouet, 1968, p. 296).

Montagne's original illustration: PC n° MS 438-5879 | Figure 5), 438-5880 (Figure 6) and 438-5814 (Figure 7).

Comment: A later homonym of Montagne's name is *A. vitrea* Cleve. Montagne's species is indicated by Van Landingham (1967, pp. 277-278) to be a synonym of *A. ostrearia* Brébisson in Kützing, but he adds a "?" at the end of this entry.

Biddulphia australis Montagne, 1842, *Hist. Phys. Cuba, Bot., Pl. Cell.*: 5.

- = *B. pulchella* Gray 1821
- = *B. quinquelocularis* Kützing 1844.

Holotype: PC n° MA 13894 (Figure 8).

Type locality and collector: "Ad Florideas varias in portu Havanensi lectas parasitans". Cuba. Ramon de la Sagra coll.

Montagne's original illustration: PC n° MS 438-5884 (Figure 9).

Comments: This species is considered as a later synonym of *B. pulchella* Gray (Mills, 1933, p. 281; Van Landingham, 1968, p. 522). "Montague" (sic) is listed as the authority by Mills.

Fragilaria brevis Montagne, 1855, *Ann. Sci. Nat., Bot.*, 4^e sér., 3: 323.

Holotype: PC n° MA 14014 (Figure 10).

Type locality and collector: ["*In caule et foliis Hypni lonchophylli Montagne*"]², "in aquis dulcibus, prope Cayennam, fluitans". Guyana. Leprieur coll., "n° 1378" (The type of *Hypnum lonchophyllum* Montagne is held at PC, without inventory number. The label bears the notation: "13.X.89, 1 éch. Leprieur n° 1378").

Montagne's original illustration: PC n° MS 418-1187 (Figure 11).

Comments: Montagne's n° 675 corresponds to *Hypnum lonchophyllum* Montagne, on which the diatom was found. Mills (1934a, p. 724) and Van Landingham (1971, p. 1764) indicate this species was described in 1842, but this seems erroneous. This species has apparently not been observed since it was described originally.

Isthmia polymorpha Montagne, 1840, *Ann. Sci. Nat., Bot.*, 2^e sér., 13: 200, n° 9.
= *Odontella polymorpha* (Montagne) Kützing, 1844, p. 138.

Holotype: PC n° MA 6027 (Figure 12) (also the type of *Polysiphonia subtilissima* Montagne).

Type locality and collector: "Ad *Polysiphonium subtilissimum* Nob. parasitat, Meloseirae hormoidis et Achnantis seriatae in consortio" ["apud Cayennam"]³. "Leprieur coll. n° 353".

Montagne's original illustration: PC n° MS 434-4931 (Figure 13).

Comments: Mills (1934a, p. 870) suggests this taxon is conspecific with *Cerataulus laevis* (Ehrenberg) Ralfs, but Van Landingham (1971, p. 2089) registered some uncertainty by providing a "?" next to his proposed synonymy of *I. polymorpha* with *Biddulphia laevis* Ehrenberg.

Navicula aequinoctialis Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 309, "1850" (1851).

Holotype: PC n° MA 13630 (Figures 14-15) (also the type of *Phormidium guyanense* Montagne, typified by F. Drouet, 1968, p. 134).

Type locality and collector: "*In consortio Phormidii guyanensis inventi*". Guyana. Leprieur coll., "n° 1093".

Montagne's original illustration: PC n° MS 438-5823 (Figure 16).

² The part of the sentence into square brackets comes from the *Sylloge*, the rest comes from the diagnosis of *Hypnum lonchophyllum*.

³ The part of the sentence into square brackets comes from the *Sylloge*.

Comments: This species was suggested (with a "?") to be a synonym of *Pinnularia dactylus* Ehrenberg by Mills (1934a, p. 972).

Navicula algeriensis Montagne in Bory de Saint-Vincent & Durieu de Maisonneuve, 1849, *Expl. Sci. Algérie, Bot.* 1: 190.

Holotype: PC n° MA 14158 (Figure 17). Montagne wrote on the herbarium sheet (Figure 18): "Le *Navicularia* (*sic*) *algeriensis* doit passer dans le genre *Pinnularia* si il est bon".

Type locality and collector: "In fronde *Plocamii coccinei* in consortio *Biddulphiae pulchellae* Gray; Cherchell". Bory de Saint-Vincent coll.

Montagne's original illustration: PC n° MS 438-5927 (Figure 19) and MS 438-5885 (Figure 20).

Comments: This species was listed by Mills (1934a, p. 974), and Van Landingham (1975, p. 2367) in lower case letters, suggesting it is a later synonym, but no preferred name was indicated.

Rhipidophora craticula Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 308, "1850"(1851).

Holotype: PC n° MA 11352 (Figure 21). Isotypes: MA 11350 and MA 11353 (Figure 21) (all numbers + n° MA 11351, Figure 21, correspond to type material of *Cladophora oedogonia* Montagne).

Type locality and collector: "In *Cladophora Oedogonia* [Montagne] *parasitica*" [*Cayenna*]. Guyanna. [Leprieur] + "coll. n° 826".

Montagne's original illustration: PC n° MS 430-5430 (Figure 22).

Comments: This species was first transferred to *Podosphenia* by Rabenhorst (1864, p. 298) and then later to *Liemophora* by De Toni (1892, p. 739) with a "?".

Schizonema crispum Montagne, 1842, *Prodr. gen. phyc.*: 16.

Lectotype: PC n° MA 14190 (Figure 23).

Isotype: PC n° MA 14189 (Figure 23).

Type locality and collector: "Ins. Auckland". Dumont "d'Urville" coll.

Montagne's original illustration: PC n° MS 438-5939 (Figure 24).

Comments: Grunow (1880, p. 1594) transferred this species to *Berkeleya*.

* Parts of the sentence into square brackets comes from the *Sylloge*.

Schizonema investiens Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 308, "1850" (1851).

Holotype: PC n° MA 14226 (Figure 25).

Type locality and collector: "In *Bostrychia monosiphonia* [Montagne] *supra descripta parasitans lectum*". Guyana. Leprieur "coll. n° 1111". (N.B. Type material of *Bostrychia monosiphonia* Montagne is held at PC under the n° MA 626, 627, 628 and 629).

Montagne's original illustration: MS 438-5941 (Figure 26).

Comments: Mills (1934b, p. 1432) lists this species as a valid member of *Schizonema*.

Genus *Trochiscia* Montagne, 1838, *Ann. Sci. Nat., Bot.*, 2^e sér., 8: 349, "1837" (1838).

Holotype: PC n° MA 14185 (Figure 27).

Type locality and collector: "Ad fila *Callithamnii floccosi* Ag. Ad Callao legit cl. du Petit-Thouars". Peru.

Montagne's original illustration: MS 438-5934 (Figure 28).

Type species: *Trochiscia moniliformis* Montagne, 1838, *Ann. Sci. Nat., Bot.*, 2^e sér., 8: 349, "1837"(1838) = *Melosira hormoides* Montagne, 1839, p. 2 (*sub Meloseira*) = *Podosira nummuloides* Ehrenberg, 1840, p. 158 = *Podosira moniliformis* Ehrenberg, 1840, p. 161 = *Podosira hormoides* (Ehrenberg) Kützing, 1844, p. 52, *nom. illeg.*

Holotype: PC n° MA 14185 (Figure 27).

Type locality and collector: *Ad fila Callithamnii floccosi* Ag. *Ad Callao legit cl. du Petit-Thouars*. Peru.

Montagne's original illustration: MS 438-5934 (Figure 28) and MS 438-5935 (Figure 29).

Comments: Montagne described his genus from Peru, and included in it a single species *T. moniliformis*. In the original publication (1838), Montagne described this diatom on *Callithamnion floccosum*. Two years later (1839) he reported it on *Polysiphonia dendroides* and *C. floccosum*. In the *Sylloge* (Montagne, 1856) he lists it only from *Polysiphonia*. The original drawing is made of *Trochiscia* on *Callithamnion versicolor*, and the label indicates: "voir le *Callithamnion thuyoides* et le *C. floccosum*". PC specimens of these species from the same locality include the holotype material of *Trochiscia* on *C. floccosum* (n° MA 14185), *C. versicolor* C. Ag. (n° MA 1204 and MA 1205) and "*C. thuyoides* C. Ag.?" (n° MA 1201, MA 1202 and MA 1203).

Trochiscia Montagne is a later homonym of *Trochiscia* Kützing 1833, a green algal genus. The Kützing article was reprinted in 1834 by Farr *et al.* 1979 in the *Index Nominum Genericorum*. Thus, *Trochiscia* Montagne is to be considered *nom. illeg.*

Regarding the specific epithet for Montagne's species, *T. moniliformis* was transferred to *Melosira* by Montagne in 1839. The specific epithet *moniliformis* was occupied in *Melosira* by *M. moniliformis* Agardh, so a new name, *M. hormoides* Montagne was selected. In 1840, Ehrenberg described his new genus *Podosira* and included in it *P. nummuloides* and *P. moniliformis*. Kützing (1844) then transferred Montagne's *Melosira hormoides* to *Podosira*, making the combination *P. hormoides* (Montagne) Kützing. Both Mills (1934a, p. 1356) and Van Landingham (1978, p. 3412 and p. 3414) indicate Ehrenberg's species as synonyms of Montagne's species, although Van Landingham apparently regarded *T. moniliformis* Montagne and *M. hormoides* Montagne as different entities, since *T. moniliformis* is listed as "Montagne 1837, p. 349" (Van Landingham, 1978, p. 3414) and *M. hormoides* is listed to have its original description in "Montagne, 1839, p. 2" (Van Landingham, 1978, p. 3412). If Ehrenberg's taxa are synonymous with Montagne's species, then Ehrenberg's two new species names are superfluous (Greuter *et al.*, 1994, Article 52). The correct names for Montagne's taxon are:

Trochiscia moniliformis Montagne

Melosira hormoides Montagne

Podosira moniliformis (Montagne) Ehrenberg

Podosira moniliformis (Montagne) Kützing would then be considered *nom. illeg.*

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LEGENDS OF THE FIGURES

Figs. 1-3. *Achmanthes brachypus* Montagne, 1838, *Ann. Sci. Nat., Bot.*, 2^e sér., 8: 348, "1837" (1838) 1. Holotype with Montagne's original illustration; PC n° MA 13863. 2. Montagne's original illustration, PC n° MS 438-5875. 3. Montagne's original illustration, PC n° MS 438-5876.

Figs. 4-7. *Amphora vitrea* Montagne, 1861, *Ann. Sci. Nat., Bot.*, 4^e sér., 14: 167, "1860" (1861). 4. Lectotype, PC n° MA 13882. 5. Montagne's original illustration, PC n° MA 438-5879. 6. Montagne's original illustration, PC n° MA 438-5880. 7. Montagne's original illustration, including illustration of *Oscillatoria nectarensis* Montagne, PC n° MA 438-5814.

Figs. 8-9. *Biddulphia australis* Montagne, 1842, *Hist. Phys. Cuba, Bot., Pl. Cell.*: 5. 8. Holotype, PC n° MA 13894. 9. Montagne's original illustration, PC n° MS 438-5884.

Figs. 10-11. *Fragilaria brevis* Montagne, 1855, *Ann. Sci. Nat., Bot.*, 4^e sér., 3: 323. 10. Holotype, PC n° MA 14014. 11. Montagne's original illustration, including illustration of *Hypnum lonchophyllum* Montagne, PC n° MS 418-1187.

Figs. 12-13. *Isthmia polymorpha* Montagne, 1840, *Ann. Sci. Nat., Bot.*, 2^e sér., 13: 200, n° 9. 12. Holotype, PC n° MA 6027 (also the type of *Polysiphonia subtilissima* Montagne). 13. Montagne's original illustration, PC n° MS 438-4931.

Figs. 14-16. *Navicula aequinoctialis* Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 309, "1850" (1851). 14. Labels. 15. Holotype, PC n° MA 13630 (also the type of *Phormidium guyanense* Montagne). 16. Montagne's original illustration, PC n° MS 438-5823, including illustration of *Phormidium guyanense* Montagne.

Figs. 17-20. *Navicula algeriensis* Montagne in Bory de Saint-Vincent & Durieu de Maisonneuve, 1849, *Expl. Sci. Algérie, Bot.* 1: 190. 17. Holotype, PC n° MA 14158. 18. Montagne's comment on the herbarium sheet. 19. Montagne's original illustration, PC n° MS 438-5927. 20. Montagne's original illustration, PC n° MS 438-5885.

Figs. 21-22. *Rhipidophora craticula* Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 308, "1850" (1851). 21. Lectotype, PC n° MA 11352, and isotypes, MA 11350 and MA 11353 (all numbers + n° MA 11351 correspond to type material of *Cladophora vedogonia* Montagne). 22. Montagne's original illustration, PC n° MS 438-5430.

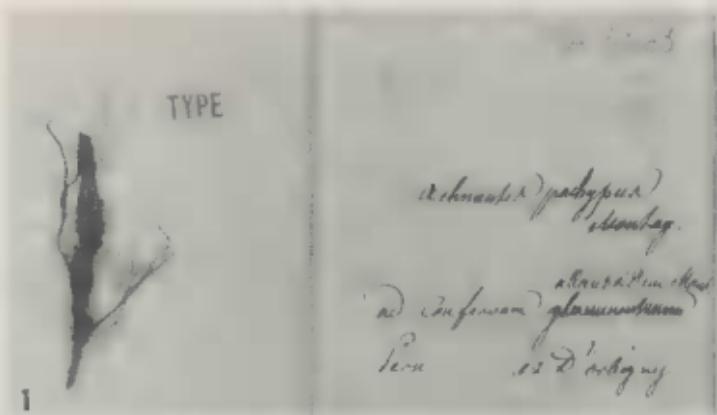
Figs. 23-24. *Schizonema crispum* Montagne, 1842, *Prodr. gen. phyc.*: 16. 23. Lectotype, PC n° MA 14190, and isotype, n° MA 14189. 24. Montagne's original illustration, PC n° MS 438-5939.

Figs. 25-26. *Schizonema investiens* Montagne, 1851, *Ann. Sci. Nat., Bot.*, 3^e sér., 14: 308, "1850" (1851). 25. Holotype, PC n° MA 14226. 26. Montagne's original illustration, PC n° MS 438-5941.

Fig. 27-29. *Trochiscia moniliformis* Montagne, 1838, *Ann. Sci. Nat., Bot.*, 2^e sér., 8: 349, "1837" (1838). 27. Holotype of genus and species, PC n° MA 14185. 28. Montagne's original illustration, PC n° MS 438-5934. 29. Montagne's original illustration, PC n° MS 438-5935.

Scale of the herbarium sheets: Width of printed word "TYPE" = 11 mm.

Scale of Montagne's original illustrations: Width of herbarium stamp = 45 mm.





3

Aechmatherus parviflorus Montg.



4

Infrata vidua n.
C. C. 1900
Same thermal dept. Yachter
Aug de L'Isle 1. 1908

Amphibolites de St. Etienne (M. Lefèvre)
Amphibolites d'Allevard (M. Lefèvre)

9
2
8
5
3

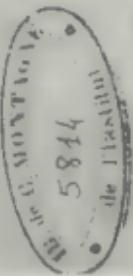
5

Amphibolites de la Roche (G. de Don)
Amphibolites de Bréchac



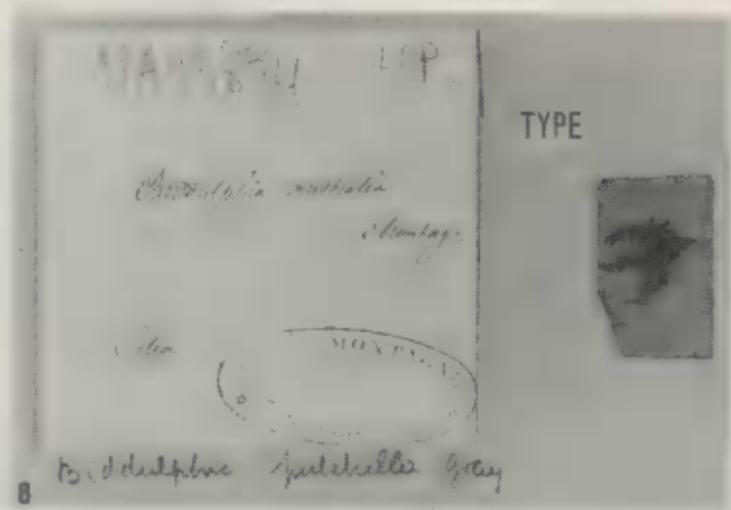
6

S. nitens in ag. Salini *Salinarium tenuis* H. & A. (H. et
Locco n. 2320 ex sp. biformis)
Open soil
Gemmatae offshoots
Anopheles infestation by
and C. *Salinarium* L.



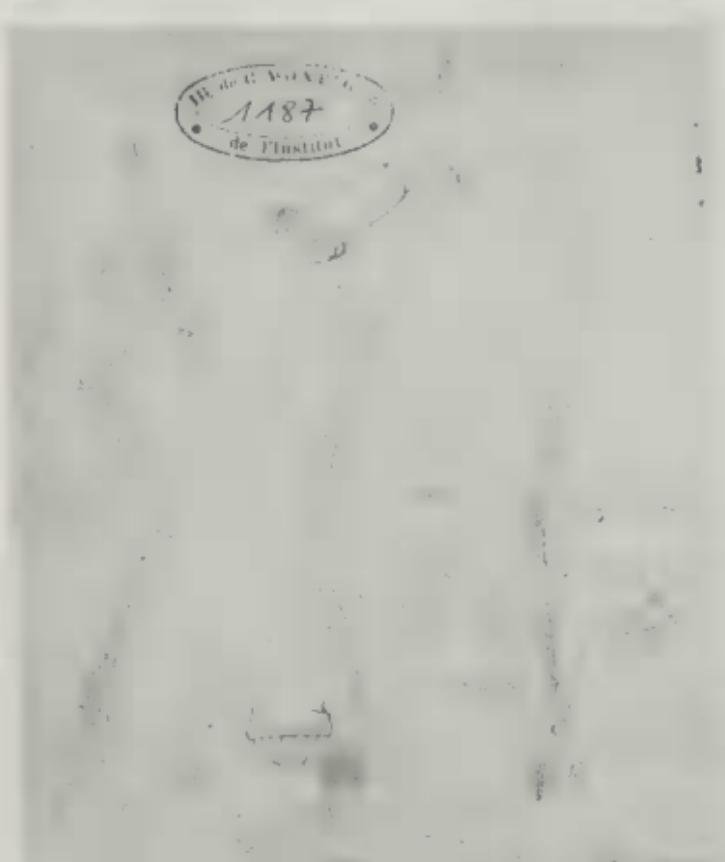
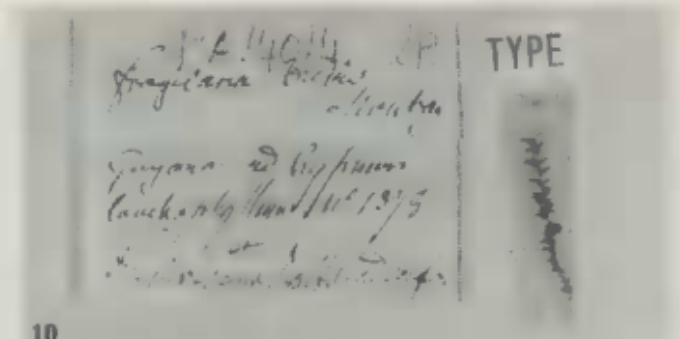
700 radicles
4 ad 5 mm diam.
ile Flacq

7



9

Bidulphia australis Montag.



Sp. 1878
lyrae *decepta* *sp.*

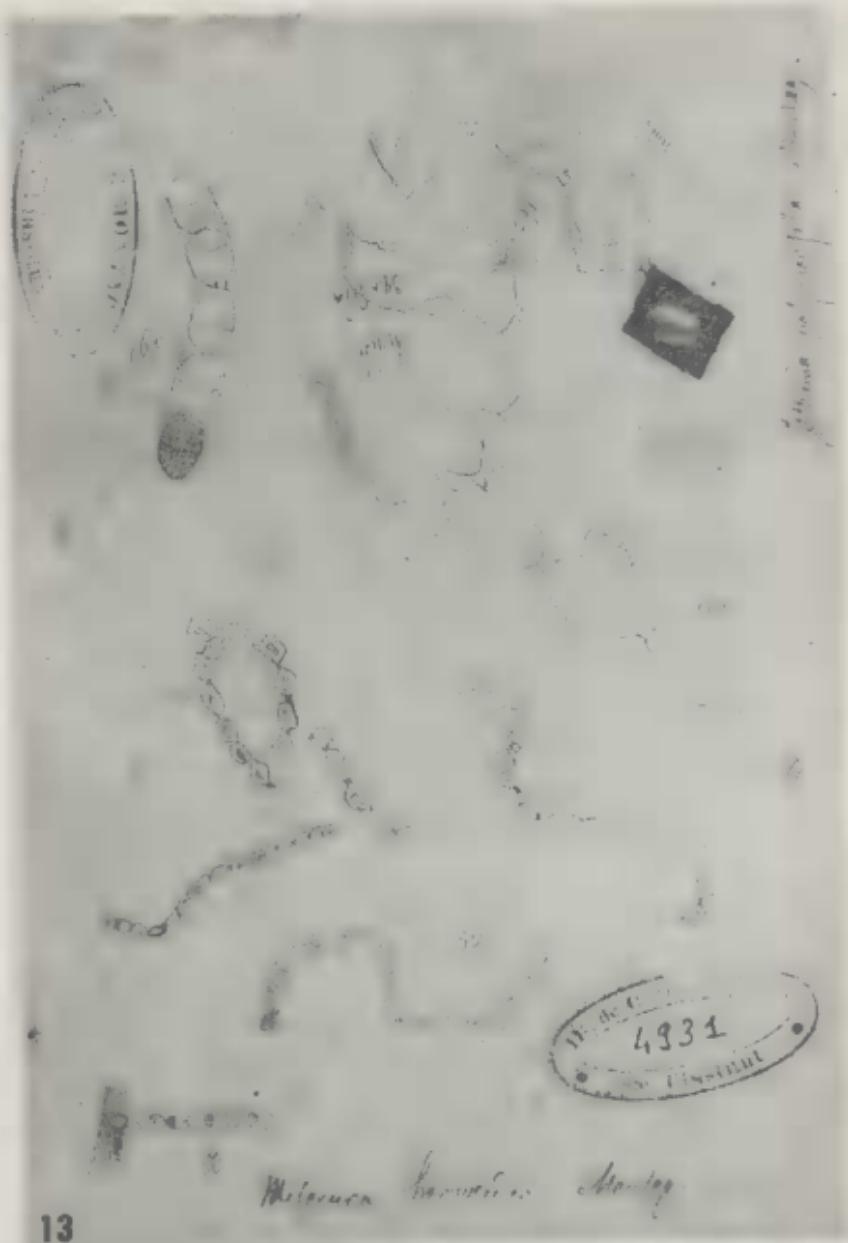


2805

Atrypia polymorpha Montag.
Metacera loriculata Montag.
Schubert. Circa 1860. Ag.

a. *Polytichonium subtetragonum*
, Montag.
Agree. Letr. 1860
in the course of 20 years
from the first to the last

TYPE



TYPE

Phormidium inundatum (Küg.) Gom
(TYPE of *P. guyanense* Montagne)

14

Detained by French Dieses

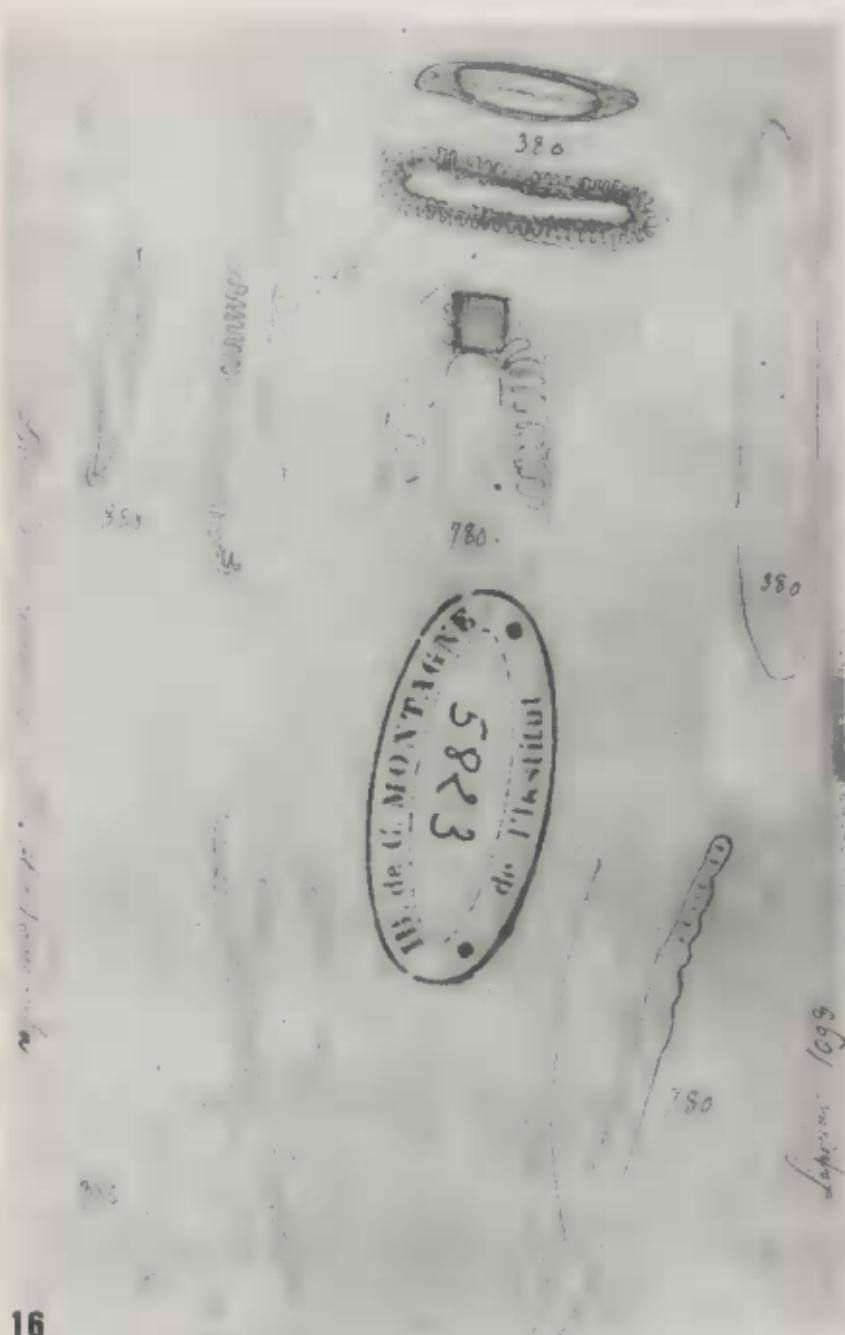
1960

"Guyana: fundo limosa
rivularum adhaerens circa
Cayenne lectum, Leprieur
no. 1093."

W.M. 1960
Lepidizaceae
Lepidizaceae
Druce

15





TYPE

4338

Tauvia algeriensis sp. n.

ad. ♂

Charente



17

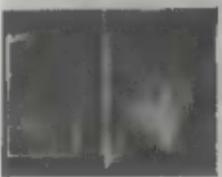
Tauvia algeriensis
Dautzenberg et Wagner
sp. n.
multicostata
West Ind.

18



20





426
Janvier 1904
du port de Chypre
de cage n° 2

Q 426 2P
Tubular polypellon 28 mm
Montag.
cage 2
Lyon - Montagne

abîme de 50 m
Corallozoïde
mésophyll n° 20 cage 2

TYPE

HA 11351

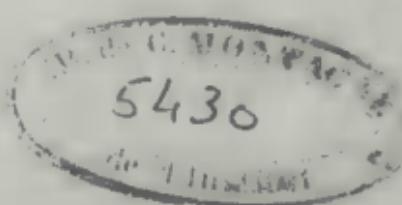


22

Uphyphora?

calcareous material from off the

826



1971 P
Schizoneura crippum
 Hennig



ad Saliciph. glomerulatae
 Ducke 11. D'Urville

TYPE

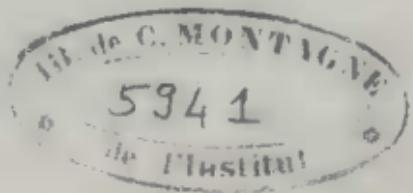
1971 P. 19.
Schizoneura crippum
 Hennig
 ad Saliciph. glomerul.
 Ducke 11. D'Urville



Schizothrix ciliata Steyermark







M 4783

TYPE



c. Polypora? horridula?
Savigny.

Intrae [?] terran
ad *(C. Polypora?) floriforme*



Sample *Cerco 160 fm*
1 m. de profunditate

varie *(Callithamnion) Thysidice*
et *C. floccosa*

5934

28



29

Gillottella on *Metarrhizium hamatae* 1 October 5935